DATE: 03/12/01

TO: Burl Maupin / Superfund/KEAC/TDEC

FROM: David Stucki/Aquatic Biology/ Lab Services/TDH.

SUBJECT: Ceriodaphnia dubia 48 hour Acute Static Non-renewal Definitive Test, Smokey Mountain Smelters leachate, Knox County, Tennessee. Lab log # T0103001.

Summary

During the period of March 7 - 9, 2001 a Ceriodaphnia dubia 48 hour Acute Static Non-Renewal Definitive Test was conducted with the leachate from Smokey Mountain Smelters, Knox County, Tennessee.

a. A single sample was collected from Smokey Mountain Smelters at 1830 hours on 03/06/01. The sample was delivered by Greyhound Bus and arrived at the lab at 0900 on 03/07/01.

b. Six concentrations were used to test for toxicity of the leachate: 50%, 25%, 12.5%, 6.25%, 3.125%, and 1.56%. The Ceriodaphnia controls completed the acceptability criterion of 90% or greater survival at 48 hours.

c. The dissolved oxygen, conductivity and pH of each concentration and control were measured prior to initial organism exposure. The dissolved oxygen and pH were measured for each concentration and control at test termination.

d. Acute Static Definitive test results:

Permit Criteria	Permit Requirement	Test Results	Pass/ Fail
NA	NA	LC50 <1.56%	NA

Test procedures for static definitive tests were followed in accordance with procedures outlined in the USEPA manual "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" EPA/600/4-90/027F.

Acute Static Non-Renewal Definitive Ceriodaphnia dubia Report

T.D.H.
Aquatic Biology, Laboratory Services
Nashville, Tennessee (615) 262-6327

Industry/Effluent Name: Smokey Mountain Smelters.

Location:

County: Knox
NPDES #: NA

Test Dates: March 7 – 9, 2001

Participants:

1. David Stucki, Aquatic Biology, Lab Services, TDH
3. Field collection: Burl Maupin, Superfund/KEAC/TDEC

Effluent:

1. Number of samples: One.
2. Legal tag received with samples? Yes.
3. Sample collection date: 03/06/01

Dilution Source:

Lab water: 23% Perrier water

Test Organisms:

1. Species: Ceriodaphnia dubia
2. Age at start of test: ≤24 hours

Food:

1. Type: YCT and Selenastrum algae conc.
2. Quantity: 0.1ml each
3. Regime: fed before test initiation

Test Conditions:

1. Vessels: 30-ml plastic cups, 15-ml test volume
2. Incubator temp range: 24.7 °C – 25.1° C.
3. Light intensity range: 53.0 – 92.9 ft. candles

Results:

Survivors at 48 hours

Replicate	50%	25%	12.5%	6.25%	3.125%	1.56%	Control
1	0	0	0	0	0	0	5
2	0	0	0	0	0	0	5
3	0	0	0	0	0	0	5
4	0	0	0	0	0	0	5

LC50 <1.56%

Tables Presented:

Table 1. Collection Regime Table.

Table 2. Acute Survival Data.

Table 3. Acute Water Quality Data.

Table 1. Collection time and date for Ceriodaphnia dubia 48 hour Acute Static Non-renewal Definitive tests. Smokey Mountain Smelters, Knox Co., Tennessee March 7 – 9, 2001.

Sample #	Date Collected	Time Collected
1	03/06/01	1830

Table 2. Ceriodaphnia dubia (Cd) 48 hour Acute Static Non-renewal Definitive results. Smokey Mountain Smelters, Knox Co., Tennessee, March 7–9, 2001. Analyst: David Stucki, Aquatic Biology, Lab Services, TDH.

	Survivors at 48 hours							
# Exposed	50%	25%	12.5%	6.25%	3.125%	1.56%	Control	LC50
20/conc.	0	0	0	0	0	0	20	<1.56%

Table 3. Water quality results from a Ceriodaphnia dubia 48-hour Acute Static Non-renewal Definitive test, Smokey Mountain Smelters, Knox Co., Tennessee, March 7-9, 2001.Analyst: David Stucki, Aquatic Biology, Lab Services, TDH.

Sample #1

	(Before)	(before/after)	(before/after)
Concentration	**Conductivity**	**Dissolved Oxygen**	**pH**
50%	45,300	7.3 / 7.1	9.3 / 8.8
25%	26,000	7.6 / 7.2	9.3 / 9.0
12.5%	13,120	7.7 / 7.4	9.3 / 8.7
6.25%	7,100	7.6 / 7.4	9.2 / 8.5
3.125%	3,770	7.8 / 7.4	9.1 / 8.4
1.56%	1864	7.9 / 7.5	9.0 / 8.4
Control	190	7.9 / 7.6	8.3 / 8.3

Hardness

Dilution Water	93
Sample (100%)	2788

DATE: 03/12/01

TO: Burl Maupin / Superfund/KEAC/TDEC

FROM: David Stucki/Aquatic Biology/ Lab Services/TDH.

SUBJECT: Pimephales promelas 48 hour Acute Static Non-renewal Definitive Test, Smokey Mountain Smelters leachate, Knox County, Tennessee. Lab log # T0103002.

Summary

During the period of March 7 - 9, 2001 a Pimephales promelas 48 hour Acute Static Non-Renewal Definitive Test was conducted with the leachate from Smokey Mountain Smelters, Knox County, Tennessee.

a. A single sample was collected from Smokey Mountain Smelters at 1830 hours on 03/06/01. The sample was delivered by Greyhound Bus and arrived at the lab at 0900 on 03/07/01.

b. Six concentrations were used to test for toxicity of the leachate: 50%, 25%, 12.5%, 6.25%, 3.125%, and 1.56%. The control organisms completed acceptability criterion of 90% or greater survival at 48 hours.

c. The dissolved oxygen, conductivity and pH of each concentration and control were measured prior to initial organism exposure. The dissolved oxygen and pH were measured for each concentration and control at test termination.

d. Acute Static Definitive test results:

Permit Criteria	Permit Requirement	Test Results	Pass/ Fail
NA	NA	LC50 <1.56%	NA

Test procedures for static definitive tests were followed in accordance with procedures outlined in the USEPA manual "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" EPA/600/4-90/027F.

Acute Static Non-Renewal Definitive Pimephales promelas Report

T.D.H.
Aquatic Biology, Laboratory Services
Nashville, Tennessee (615) 262-6327

Industry/Effluent Name: Smokey Mountain Smelters.

Location:

County: Knox
NPDES #: NA

Test Dates: March 7 – 9, 2001

Participants:

1. David Stucki, Aquatic Biology, Lab Services, TDH
3. Field collection: Burl Maupin, Superfund/KEAC/TDEC

Effluent:

1. Number of samples: One.
2. Legal tag received with samples? Yes.
3. Sample collection date: 03/06/01

Dilution Source:

Lab water: 23% Perrier water

Test Organisms:

1. Species: Pimephales promelas
2. Age at start of test: 9 days

Food:

1. Type: Artemia nauplii.
2. Regime: fed before test initiation

Test Conditions:

1. Vessels: 600-ml plastic cups, 350-ml test volume
2. Incubator temp range: 24.7 °C – 25.1° C.
3. Light intensity range: 53.0 – 92.9 ft. candles

Results:

Survivors at 48 hours

Replicate	50%	25%	12.5%	6.25%	3.125%	1.56%	Control
1	0	0	0	0	0	0	10
2	0	0	0	0	0	0	10
3	0	0	0	0	0	0	10
4	0	0	0	0	0	0	10

LC50 <1.56%

Tables Presented:

Table 1. Collection Regime Table.

Table 2. Acute Survival Data.

Table 3. Acute Water Quality Data.

Table 1. Collection time and date for Pimephales promelas 48 hour Acute Static Non-renewal Definitive tests. Smokey Mountain Smelters, Knox Co., Tennessee March 7 – 9, 2001.

Sample #	Date Collected	Time Collected
1	03/06/01	1830

Table 2. Pimephales promelas 48 hour Acute Static Non-renewal Definitive results. Smokey Mountain Smelters, Knox Co., Tennessee, March 7–9, 2001. Analyst: David Stucki, Aquatic Biology, Lab Services, TDH.

	Survivors at 48 hours							
# Exposed	50%	25%	12.5%	6.25%	3.125%	1.56%	Control	LC50
40/conc.	0	0	0	0	0	0	40	<1.56%

Table 3. Water quality results from a Pimephales promelas 48-hour Acute Static Non-renewal Definitive test, Smokey Mountain Smelters, Knox Co., Tennessee, March 7-9, 2001.Analyst: David Stucki, Aquatic Biology, Lab Services, TDH.

Sample #1

	(Before)	(before/after)	(before/after)
Concentration	**Conductivity**	**Dissolved Oxygen**	**pH**
50%	45,300	7.3 / 2.5	9.3 / 9.3
25%	26,000	7.6 / 6.2	9.3 / 9.2
12.5%	13,120	7.7 / 6.0	9.3 / 9.1
6.25%	7,100	7.6 / 6.4	9.2 / 8.8
3.125%	3,770	7.8 / 6.3	9.1 / 8.4
1.56%	1864	7.9 / 6.5	9.0 / 8.3
Control	190	7.9 / 7.9	8.3 / 8.2

Hardness

Dilution Water	93
Sample (100%)	2788

STATE OF TENNESSEE - ENVIRONMENTAL LABORATORIES

Please Print Legibly

EAC-K MAR 19 2001

Biological Analysis

**Schedule must be arranged in advance for all tests (615) 262-6327

Project/Site No.	47-559
Project Name	Smokey Mountain Smelters
Station No.	SMS-LW-01
County	Knox
Description	Leachate at south waste pile
Stream Mile	
Depth	
Collection Date	3-6-01
Time	18:30
Sampler's name (Print)	Jason Nail / Burl Maupin
Sampling Agency	Superfund
Billing Code	3273805
If Priority, Date Needed	4-6-01
Send Report to	KEAC
Contact Hazard	
Date Reported	3/12/01
By	David Stuchi
Reviewed By	Elaine Majure
Reviewed by	

BIOLOGICAL SURVEYS

- [ ] Macroinvertebrate Recon
- [ ] Rapid Bioassessment (State SOP)
- [ ] Intensive Survey - Surber
- [ ] Intensive Survey - Dendy
- [ ] Fish Population Recon
- [ ] Fish Population Intensive
- [ ] Fish Tissue Collection
- [ ] Chlorophyll Analysis
  - Log Number
  - Chlorophyll a
  - Pheophyton
- [ ] SPECIAL STUDIES

(Please Specify)

RECEIVED MAR 14 2001

Screening Bioassays

(Cannot be used for permitting)

48 hr Static Screening Cd
- Log Number
- LC50 @ 24 hrs
- LC50 @ 48 hrs

48 hr Static Screening Pp
- Log Number
- LC50 @ 24 hrs
- LC50 @ 48 hrs

Acute Bioassays

[X] 48 hr Static Definitive Cd
- Log Number T0103001
- LC50 @ 24 hrs
- LC50 @ 48 hrs < 1.56 %
- NOAEC
- LOAEC

[X] 48 hr Static Definitive Pp
- Log Number T0103002
- LC50 @ 24 hrs
- LC50 @ 48 hrs < 1.56 %
- NOAEC
- LOAEC

96 hr Static Definitive Cd
- Log Number
- LC50 @ 24 hrs
- LC50 @ 48 hrs
- LC50 @ 72 hrs
- LC50 @ 96 hrs
- NOAEC
- LOAEC

96 hr Static Definitive Pp
- Log Number
- LC50 @ 24 hrs
- LC50 @ 48 hrs
- LC50 @ 72 hrs
- LC50 @ 96 hrs
- NOAEC
- LOAEC

Chronic Bioassays

Chronic Cd
- Log Number
- LC50 @ 24 hrs
- LC50 @ 48 hrs
- LC50 @ 72 hrs
- LC50 @ 96 hrs
- Survival
  - NOAEC
  - LOAEC
- Reproduction
  - NOAEC
  - LOAEC
- IC25

Chronic Pp
- Log Number
- LC50 @ 24 hrs
- LC50 @ 48 hrs
- LC50 @ 72 hrs
- LC50 @ 96 hrs
- LC50 @ 120 hrs
- LC50 @ 144 hrs
- LC50 @ 168 hrs
- Survival
  - NOAEC
  - LOAEC
- Growth
  - NOAEC
  - LOAEC
- IC25

Chlorine Residual

Lab Parameters
- pH
- Cond.
- D.O.
- Temp.

Branch Lab Number

Chain of Custody (sign full name)

1. Collected by Burl Maupin/Jason Nail
   Date 3-6-01 Time 10:30
   Delivered to KBL
   Date 3-6-01 Time 12:00
2. Received by Jamie A. Bibee
   Date 3-6-01 Time 12:00
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Rec'd in Lab by
   Date Time
   Logged in by David Stuchi
   Date 3/7/01 Time 0930

Additional Information

1. Approx. volume of sample 2 GAL
2. Nearest town or city Knoxville
3. Others present at collection none
4. Number of other samples collected at same time at this point 4
5. Field collection procedure, handling and/or preservation of this sample in accordance with EPA procedures and protocol
6. Mode of transportation to lab in state vehicle on ice, in cooler
7. Sample/cooler sealed by
8. Date sample/cooler sealed
9. Remarks T control bottle

3°C

GREYHOUND MAR 6 2001 15:30

1.5°C @ Labs PDS

PH-3010 (rev 1/96)

RDA 1527